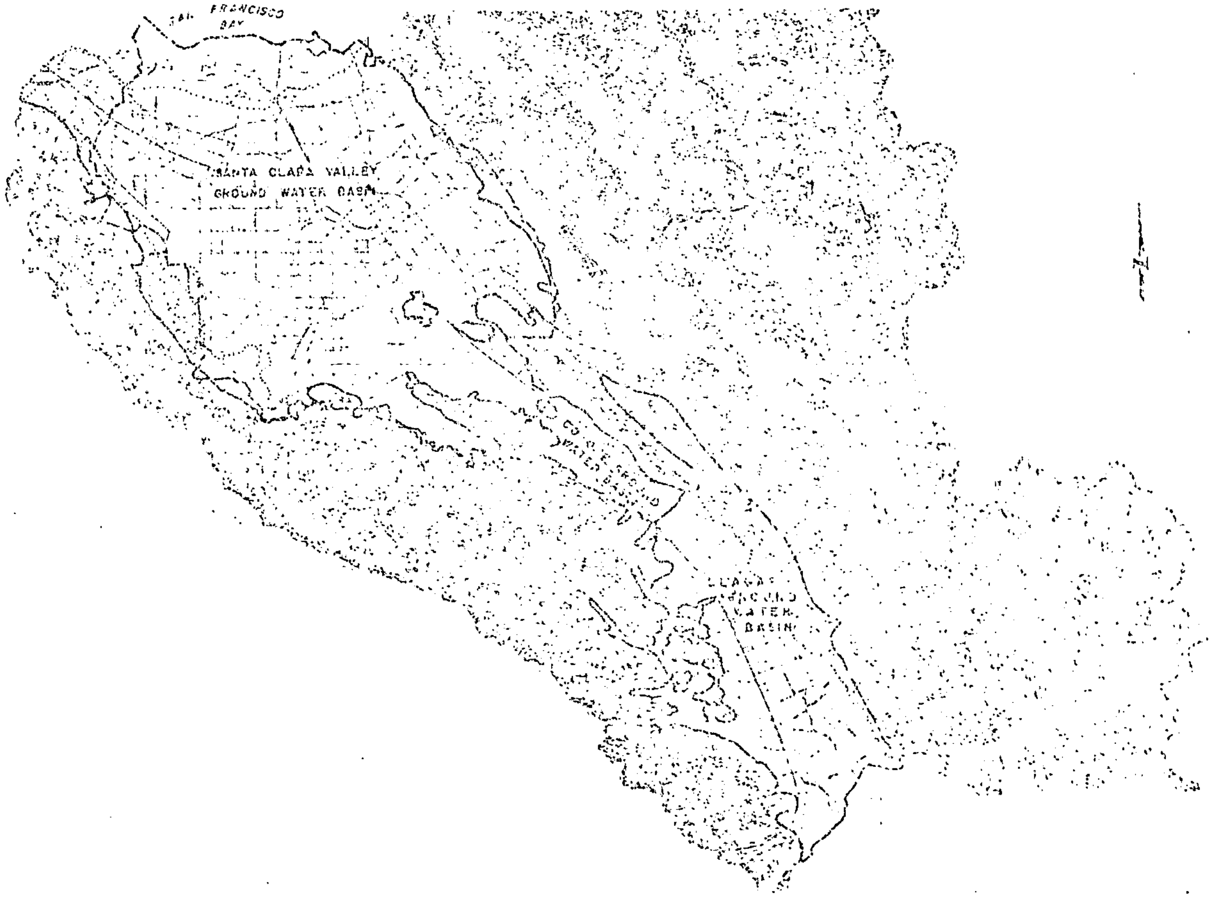
Water Supply, Flooding

ANNUAL SURVEY REPORT ON GROUND WATER CONDITIONS

1966


SAN FRANCISCO BAY
SANTA CLARA VALLEY GROUND WATER BASIN
LLAGAS GROUND WATER BASIN

SANTA CLARA COUNTY FLOOD CONTROL AND WATER DISTRICT

March 1966

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Santa Clara County Flood Control
and Water District

ANNUAL SURVEY REPORT

on

GROUND WATER CONDITIONS

1966

March 1966

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8 March 1966

Honorable Board of Supervisors
Santa Clara County Flood Control
and Water District
70 West Hedding Street
San Jose 10, California

Gentlemen:

I am pleased to transmit to you the District Engineer's "Annual Survey Report on Ground Water Conditions" in the Santa Clara County Flood Control and Water District for 1966. The report was prepared under the authority of Section 26.5 of the District Act and is the fourth of an annual series required as a prerequisite to the levy of a ground water charge for the production of water from the ground water supplies within a zone or zones of the District.

The reported investigation finds that an overdraft condition continues to exist in the major ground water basin of the District. The accumulated overdraft as of the end of the preceding (1964-65) water year was estimated to be about 685,000 acre-feet for the Zone W-2 Basin, (which covers most of the Santa Clara Valley Ground Water Basin), zero acre-feet for the Coyote Ground Water Basin, and zero acre-feet for the Llagas Ground Water Basin. This overdraft exists even though imported water from the Hetch Hetchy and the South Bay Aqueduct is available to the North County areas. There is no hope of any major alleviation of the amounts of accumulated overdraft until additional supplemental imported water supplies are available.

Imported water from the State Water Project was delivered through the South Bay Aqueduct starting in

June, 1965. About 500 acre-feet was delivered in the preceding (1964-65) water year and about 31,900 acre-feet will be delivered in the current (1965-66) water year. The Central Pipeline of the In-County Water Distribution System was completed in time to deliver this imported water to the percolation areas of Penitencia Creek and Los Gatos Creek. The first unit of the Almaden Valley Pipeline will be completed in the Spring of 1966 and deliveries of imported water will be made to the Los Capitancillos Percolation Ponds and Guadalupe Creek.

The Rinconada Force Main, first unit of the Rinconada Water Treatment Plant and West Pipeline (including the Santa Clara and Campbell Distributaries) will be advertised for construction proposals in March, 1966. This work is scheduled for completion during 1967 and treated water deliveries will be made to the San Jose Water Works, California Water Service Company, Campbell Water Company and City of Santa Clara.

The report recommends that a county-wide tax of five cents per one hundred dollars of assessed valuation be levied in the ensuing (1966-67) water year to defray a portion of the allocated capital costs of the South Bay Aqueduct, and that a ground water charge of $5.00 per acre-foot for agricultural extractions and $16.00 per acre-foot for municipal and industrial extractions be levied in the ensuing (1966-67) water year to finance the In-County Water Distribution System and the purchase of imported water from the South Bay Aqueduct.

I concur in the findings and recommendations presented in this report, and recommend that the suggested ad valorem tax and ground water charges be levied for the Fiscal Year 1966-67.

Sincerely yours,

Manager-Counsel

Acknowledgement

Valuable assistance and much of the data used in this investigation were contributed by agencies of the State of California and of the County of Santa Clara, by cities, and by private companies and individuals. This cooperation is gratefully acknowledged.

Special mention is made of the helpful cooperation of the Santa Clara Valley Water Conservation District, the South Santa Clara Valley Water Conservation District, the Sanitation Districts of Santa Clara County, the San Jose Water Works, and the Santa Clara County Planning Department.

INTRODUCTION

This is the fourth annual survey report on ground water conditions in the Santa Clara County Flood Control and Water District and the Zones thereof. It has been prepared in accordance with the requirements of Section 26.5 of the District Act as revised on 16 July 1965.

The purpose of this report is to inform the District Board of Supervisors of the ground water conditions in the District during the preceding water year*, 1964-65, and to assist the Board in its determinations of water supply and water use as of the last day of this water year, 1965-66, and prediction of water supply and water use for the ensuing water year, 1966-67. The information will provide a basis for the Board's determination of ground water charges for the ensuing water year, 1966-67.

The Santa Clara County Flood Control and Water District includes all of Santa Clara County. Within the District three major interconnected ground water basins have been delineated. They occupy about 240,000 acres of the total 849,000 acres in the District. These basins are delineated on Plate 1. There are other ground water basins within the District, such as Antelope Valley in the northeast corner of the County, and many localized ground water supplies are tapped in the mountains and small valleys of the District. Since the use of these supplies at present is small, only the major ground water basins are considered within the scope of this report.

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*Water year is defined in Section 26.1 of the District Act as "July 1st of one calendar year to June 30th of the following calendar year."

Zone W-2 was formed on 11 February 1963, encompassing all water producing facilities that will benefit from the importation of water via the South Bay Aqueduct. Except for the northwestern area, the boundaries of Zone W-2 are coterminous with the Santa Clara Valley Ground Water Basin. Its boundaries are shown on Plate 1. Within Zone W-2 all water producing facilities are located, registered with the District, and a charge can be levied on water production to support the cost of importing and distributing supplemental water.

Because of the close relationship between the boundaries of the water importation Zones and the Santa Clara Valley Ground Water Basin, this report considers them synonymous and reports the water supply and water use for Zone W-2 as a ground water basin.

The following report is a summarization of the volumes of basic data and detailed computations made to determine the ground water conditions and water supply and water use information required by Section 26.5 of the District Act. The required information is developed and reported in three sections followed by a summary of findings and recommendations. For a more detailed explanation of the computations and relationships between water supply, water disposal, ground water storage, accumulated overdraft, and ground water extractions, reference is made to the previous Annual Survey Reports.

WATER SUPPLY AND DISPOSAL

Precipitation and runoff measurements made at sampling stations in Santa Clara County indicate that the local water supply during the 1964-65 water year was slightly above normal. The seasonal precipitation recorded by the U. S. Weather Bureau Station at San Jose was about 107 percent of the long-time mean of 14.05 inches while the precipitation station at Gilroy recorded about 106 percent of the long-time mean of 19.89 inches. Precipitation on a District wide basis averaged about 105 percent of the long-time mean. The seasonal precipitation and accumulated departure of the seasonal precipitation from the mean for San Jose is shown on Plate II.

Runoff from streams originating on the west slopes in the Santa Cruz Mountains and in the Mount Hamilton Range on the east side of the valley was about 103 percent of the long term average during the 1964-65 water year. Runoff from streams regulated by surface storage reservoirs upstream of the Santa Clara Valley, Coyote, and Llagas Ground Water Basins filled 98,000 acre-feet of a potential storage capacity of 174,400 acre-feet in these reservoirs. During the 1964-65 water year 27,600 acre-feet was stored for release to the Santa Clara Valley Ground Water Basin; 11,400 acre-feet to the Coyote Ground Water Basin; and 4,300 acre-feet to the Llagas Ground Water Basin. The remaining 54,700 acre-feet was stored for release in the current 1965-66 water year.

Subsurface inflow into the Santa Clara Valley Ground Water Basin occurs from the adjacent hills, San Francisco Bay, the compaction of sub-surface sediments and from the Coyote Ground Water Basin. In the Llagas Ground Water Basin subsurface water enters from the Coyote Ground Water Basin and the adjacent hills and in the Coyote Ground Water Basin subsurface water enters from the adjacent hills. In the 1964-65 water year about 31,500 acre-feet entered the Santa Clara Valley Ground Water Basin; about 3,200 acre-feet entered the Coyote Ground Water Basin and about 11,100 acre-feet entered the Llagas Ground Water Basin. In the Santa Clara Valley Ground Water Basin inflow from San Francisco Bay and water of compaction, about 16,000 acre-feet, is not a desirable condition and should not be considered part of the long term water supply. Therefore, this water is treated as a change in storage and becomes a part of the overdraft and the accumulated overdraft. Since the water obtained from compaction of the sediments will not be replaced, this item is not part of the accumulated overdraft

TABLE 1

SUMMATION OF THE ANNUAL ITEMS OF WATER SUPPLY AND WATER DISPOSAL TO THE ZONES OR GROUND WATER BASINS OF THE DISTRICT FOR THE WATER YEAR 1964-65

Values in Acre-Feet

Item	Ground Water Basin			Totals
	Zone W-2	Coyote	Llagas	
Water Supply				
Precipitation	222,500	16,200	110,000	348,700
Stream & Surface Inflow	130,000	33,800	55,000	219,100
Subsurface Inflow	31,500	3,200	11,100	45,800
Import	15,800	0	0	15,800
Subtotal (to be added)	400,100	53,200	176,100	629,400
Water Disposal				
Consumptive Use	318,100	21,500	116,300	455,900
Stream Outflow	50,600	30,900	35,000	116,500
Subsurface Outflow	0	3,100	15,500	18,600
Export	84,900	0	3,600	88,500
Subtotal (to be subtracted)	453,600	55,500	170,400	679,500
Surplus (+) or Deficiency (-)	-53,500	-2,300	+5,700	-50,100

even though it is part of the overdraft. There is no subsurface outflow from the Santa Clara Valley Ground Water Basin. The estimated outflow in the 1964-65 water year from the Coyote Ground Water Basin is 3,100 acre-feet; from the Llagas Ground Water Basin is 15,000 acre-feet and zero acre-feet from the Santa Clara Valley Ground Water Basin.

The actual water supply and disposal conditions in the 1964-65 water year indicate in general that the water supply just met the needs for water in the Llagas Ground Water Basin but did not meet the needs for water in the Santa Clara Valley Ground Water Basin where a total deficiency of about 53,000 acre-feet developed. This deficiency was supplied from underground storage and resulted in a lowering of the ground water table. The actual annual water supply and disposal conditions for the three major ground water basins of the District are summarized in Table 1.

GROUND WATER CONDITIONS

The seasonal variations in water supply are regulated naturally by the large storage space in the ground water basins of the District. The ground water table fluctuates in response to the conditions of water supply and disposal. Extractions in excess of the supply to the ground water basin causes the ground water table to be lowered, whereas a supply in excess of extractions causes a rise in water levels. A long term lowering of the ground water table indicates that ground water overdraft conditions exist.

Ground Water Table Conditions

In the Santa Clara Valley and Llagas Ground Water Basins there are two large areas of confined ground water where water level elevations reflect a change in water pressure in the aquifer. In the remaining areas of these two basins and the Coyote Ground Water Basin the aquifers are unconfined and changes in water levels reflect a change in the amount of water in storage.

Changes in the elevation of ground water levels in two wells located in the Santa Clara Valley Ground Water Basin are shown on Plate III. The ground water elevations in Well No. 7S/1W-02G, located in the unconfined or forebay area, show an erratic but general decline since 1958. Well No. N8S/1E-05N, located in the pressure area, shows a uniform decline in the pressure surface since 1958 with a rate of decline more rapid than the decline in the unconfined zone. This condition indicates that the confined aquifers lack the capacity to transport ground water from the areas of recharge to the areas of discharge in the quantities being extracted without excessively steep ground water gradients. The general lowering of the ground water table in the unconfined area indicates water has been removed from storage. To correct this condition it is necessary to reduce extractions to the safe capacity of the confined aquifers and replace the water removed from storage in the unconfined aquifers. At safe capacity the pressure levels will rise to an elevation that would make the basin safe from possible salt water intrusion and control the subsidence of the ground surface.

The configuration of the ground water table in 1965 for the three ground water basins of the District is indicated by the contours on Plate IV. The ground water table in most of the Santa Clara Valley Ground Water Basin was below sea level, a condition that has existed since the late 1940's.

Changes in Ground Water Storage

A difference in the elevation of the ground water table in an unconfined aquifer represents a change in the volume of ground water in storage. Seasonal changes in storage occur when the annual variations in water supply are regulated naturally in the large underground reservoir. An accumulated loss of ground water from storage over a long term period represents a condition of ground water overdraft. In this report the total loss in ground water storage between a desirable elevation of the ground water table and the present elevation is the accumulated overdraft.

Annual Change in Storage

During the 1964-65 water year, the water supply was about normal and the water table rose in elevation. The change in elevation for the ground water basins of the District from the fall of 1964 to the fall of 1965 is shown on the Change in Ground Water Levels Map, Plate V.

An estimate of the volume of ground water represented by the change in ground water levels was made by multiplying specific yield of the sediments by the change in elevation of the ground water levels. This volume was an increase of about 66,000 acre-feet in the Santa Clara

Valley Ground Water Basin, 6,000 acre-feet in the Coyote Ground Water Basin and about 25,000 acre-feet in the Llagas Ground Water Basin. However, in the 1964-65 water year, not all of the water supply was released from surface storage to underground storage, nor was any significant amount of imported water used for ground water recharge. Therefore, when the change in underground storage was adjusted to July reflecting this reduction in recharge, the change in volume of ground water in storage in the 1964-65 water year was about -42,000 acre-feet for the Santa Clara Valley Basin, +3,000 acre-feet for the Coyote Basin and -2,000 acre-feet for the Llagas Basin ((-) indicates water removed from storage and (+) indicates water added to storage).

Accumulated Overdraft

The accumulated overdraft represents the loss in ground water storage between a desirable elevation of the ground water table and its present elevation. If it is assumed that the water table elevations in 1942 were close to those required for safe operation in the Santa Clara Valley and Llagas Ground Water Basins, then the depletion in storage as of the end of the 1964-65 water year is about 685,000 acre-feet for the Santa Clara Valley Basin and zero acre-feet for the Llagas Basin. In the Santa Clara Valley Basin the accumulated overdraft includes the removal of water from under the Bay which must be replaced when this basin is restored to a safe operation, but it does not include the water obtained from compaction of the sediments caused by the lowered ground water levels. This compaction results in land surface subsidence and it is believed that restored ground water levels under a safe basin operation will not cause the land surface to regain its former elevations because the compacted sediments cannot be expanded. In the Coyote Ground Water Basin the present 1965 ground water table is considered near a desirable elevation. Therefore, no accumulated overdraft was computed for this basin.

Average Seasonal Overdraft

The average seasonal overdraft is defined as the seasonal amount of water removed from a ground water basin that is not replaced by the long time average seasonal amounts of water supply had the present or any year's conditions of water supply and disposal existed during the long time period. For the Santa Clara Valley and Coyote Ground Water Basins, a representative long term period is from 1935-36 through 1947-48 and for the Llagas Ground

Water Basin is from 1932-33 to 1947-48.

The basic hydraulic equation states that the water supply must equal the water disposal plus or minus a change in storage. To evaluate the long term seasonal water supply for use in water management it is necessary to adjust the actual seasonal averages to what the averages would be if the 1965 conditions had existed over the long term period. The same adjustment is also made for the items of water disposal. These conditions of water supply and disposal under present conditions, as summarized in Table 2 for the zones and ground water basins of the District, were equated in the hydraulic equation and the resulting average annual overdraft computed. In the Santa Clara Valley Ground Water Basin the water of compaction from the consolidation of sediments (ground surface subsidence) is not an element of long term water supply but is considered a part of the seasonal overdraft and is dewatered storage that cannot be replaced. The computed long term overdraft is shown in Table 2. In the Coyote Ground Water Basin the computed average seasonal overdraft was small. Since the 1965 elevation of the ground water table is near the desirable level, no overdraft is considered.

TABLE 2

SUMMATION OF THE LONG TERM AVERAGE SEASONAL ITEMS OF WATER SUPPLY AND DISPOSAL UNDER PRESENT CONDITIONS TO THE ZONES OR GROUND WATER BASINS OF THE DISTRICT

Values in Acre-Feet

Item	Ground Water Basin			Totals
	Zone W-2	Coyote	Llagas	
Water Supply				
Precipitation	219,900	14,500	94,100	328,500
Stream & Surface Inflow	180,600	67,600	57,700	305,900
Subsurface Inflow	27,800	4,300	14,200	46,300
Import	15,800	0	0	15,800
Subtotal (to be added)	444,100	86,400	166,000	696,500
Water Disposal				
Consumptive Use	318,100	21,500	116,300	455,900
Stream Outflow	82,100	47,100	39,100	168,300
Subsurface Outflow	0	18,500	15,500	34,000
Export (Sewage)	84,900	0	3,600	88,500
Subtotal (to be subtracted)	485,100	87,100	174,500	746,700
Average Seasonal Overdraft	-41,000	-700	-8,500	-50,200

GROUND WATER EXTRACTIONS

The amount of water extracted from the basins of the District is an important factor in water resources management. For a desirable safe operation of the underground basins, extractions of water must be limited in quantity and location to the safe yield of the basin under artificial recharge conditions. Therefore, to relate the present condition of the ground water basins to the safe capabilities of these basins it is desirable to know the locations and amounts of extractions. For an immediate requirement, the ground water extractions are a source of revenue for the ground water recharge programs. Therefore, estimates of the present and future ground water extractions are required to estimate the level of revenue available to both the water importation program and the local conservation program.

Reliable data on the amount of ground water extractions for agricultural uses in the District is not available and estimates made were based on the area of lands irrigated, crop type, and assumed seasonal irrigations. Fortunately, the large private water companies and municipal water systems keep good records and the estimates of municipal and industrial water extractions are more reliable. The ground water production statements submitted by ground water users in Zone W-2 as a requirement of the District's ground water charge for the 1964-65 water year substantiated estimates of municipal and industrial water extraction. However, the agricultural ground water production statements in Zone W-2 for the same period were less than 40 percent of the estimates of agricultural water production. Consumptive use estimates should not be in that much error; however, as additional information is gathered from water meters to be installed on some of the agricultural wells, the reliability of estimated agricultural ground water extractions will improve.

Estimates of urban and agricultural ground water extractions from the Zones and basins of the District are shown in Table 3. The values shown for the water year 1964-65 reflect the actual conditions of water supply, whereas the 1965-66 and 1966-67 values are estimates based on assumed average year conditions.

TABLE 3

ESTIMATED SEASONAL GROUND WATER EXTRACTIONS IN THE ZONES OR GROUND WATER BASINS OF THE DISTRICT in Acre-Feet

Ground Water Basin	Zone W-2	Coyote	Llagas	Total
1964-65				
Agric. Use	100,000	10,000	51,000	161,000
Urban Use	119,000	2,000	10,000	131,000
Total	219,000	12,000	61,000	292,000
*1965-66				
Agric. Use	97,000	10,000	54,000	161,000
Urban Use	121,000	2,000	11,000	134,000
Total	218,000	12,000	65,000	295,000
*1966-67				
Agric. Use	94,000	10,000	57,000	161,000
Urban Use	123,000	2,000	12,000	137,000
Total	217,000	12,000	69,000	298,000

*Estimates based on average water supply year.

WATER IMPORTATION PROGRAM

Over the long term period the water supply to the zones and ground water basins of the District has not met the demands for water as evidenced by the estimates of seasonal overdraft and the accumulated overdraft. To alleviate this undesirable condition, it is necessary to import supplemental water to provide for the existing uses in excess of the local supply and the anticipated future increases in water requirements. The District has entered into a contract with the State of California for a supplemental water supply from the State Water Project to help overcome the long term overdraft in the Santa Clara Valley Ground Water Basin. Recognizing the fact that this project will not be able to supply the future needs of the District for supplemental water, the Board of Supervisors of the District has expressed a desire to contract for additional supplies of water from the San Felipe Division of the United States Bureau of Reclamation's Central Valley Project.

Initial deliveries of water through the State's South Bay Aqueduct were scheduled to start early in 1965. The first water was delivered through the aqueduct to Santa

Clara County in June, 1965. However, most of this water was test water and regular deliveries of imported water were not received until July, 1965.

In the last half of the 1965 calendar year, 15,200 acre-feet of water was received and used for ground water recharge along Penitencia Creek on the east side of the Santa Clara Valley Ground Water Basin and in the Los Gatos Creek area on the west side. With the completion of the Almaden Valley Pipeline (Unit I) in 1966, additional imported water will be delivered to the Los Capitancillos Percolation Ponds along Guadalupe Creek.

In 1966, the quantity of imported water will increase to 37,600 acre-feet and in 1967 to 50,600 acre-feet. Most of this imported water will be used to recharge the ground water supply and during 1967 the first water will be treated in the Rinconada Water Treatment Plant and supplied directly to the consumer through existing retail water agencies. This distribution of treated water is required because of the apparent limitations of the ground water basin aquifers to transmit needed water supplies to the areas of demand. In order to keep the use of the ground water basin within its safe capacity an increasing amount of the imported water supply will have to be treated and delivered on the surface.

Since the District's contract with the State of California does not provide an adequate supply of supplemental water to meet the expected future needs of the District, the Board of Supervisors of the District has expressed a desire to contract for additional future amounts of imported water with the United States Department of the Interior, Bureau of Reclamation. This water would be delivered through the distribution facilities of the San Felipe Division of the Central Valley Project to a point near the base of Anderson Dam. An expansion of the present In-County Water Distribution System would connect with this project integrating the major sources of imported water with the local water supplies and enable imported water to be delivered to all three major ground water basins.

In the 1964-65 water year, about 500 acre-feet of supplemental water was delivered to the Santa Clara Valley Ground Water Basin to help alleviate the overdraft of about 41,000 acre-feet. In the current (1965-66) water year, about 49,000 acre-feet of water should be imported, including about 8,000 acre-feet of water to help alleviate the accumulated overdraft (planned elimination in 30 years). However, only 31,900 acre-feet of water will be available because of limitations in the South Bay Aqueduct and the receiving facilities. In the ensuing (1966-67) water year, the District is obligated to import 48,500 acre-feet of water from the State.

To pay for the District's share of the County-wide water importation program, a limited County-wide ad valorem tax and a ground water charge for water extracted from the underground basin or delivered on the surface is lieu of extraction from Zone W-2 was levied in the water year 1965-66. In addition, charges will be made starting in 1967 for the delivery of treated water that will repay all the costs of the treatment plant, its operation and maintenance, its share of the In-County Distribution System costs, and assigned ground water charge.

Costs and Revenues

In the current (1965-66) water year, the South Bay Aqueduct was completed and is delivering water to Santa Clara County. Payments must be made to the State for the District's share of the construction and maintenance charges for the completed aqueduct including the interim

U. S. Bureau of Reclamation charge for water and operation costs for the scheduled delivery of water. Revenues collected from the ad valorem tax of five cents per 100 dollars assessed valuation levied by the District Board of Supervisors in the current (1965-66) water year after making refunds to areas using Hetch-Hetchy Aqueduct water and including any previous years' carryover was not adequate to meet the District's share of the capital costs of the South Bay Aqueduct. The ground water charge plus some limited surface water charges was used to meet the remaining capital costs, water charges, operation and maintenance costs and the In-County Water Distribution System bond costs. The ground water charge in Zone W-2 during the current (1965-66) water year was $5.00 per acre-foot of ground water extracted for agricultural use and $16.00 per acre-foot of ground water extracted for other than agricultural use. During the ensuing (1966-67) water year, payments to the State will exceed $1,500,000 and the full limited ad valorem tax plus a portion of the ground water charge will be required to meet this commitment. The estimate of the ground water charge required to meet the remaining costs is given in the following paragraphs.

The ground water production reported for the previous (1964-65) water year and the first half of the current (1965-66) water year, fell short of estimates made by the District. With reported production in the 1964-65 water year for agricultural use at 37 percent of the District's estimate and urban use at 90 percent of District's estimate revenues fell short of the anticipated collections. However, revenues collected for the first half of the current (1965-66) water year approximates the estimates, since agricultural ground water production approaching only 50 percent of District estimates was used to establish ground water charges. Revenues from non-agricultural users nearly equaled estimates made by the District indicating that ground water extraction estimates for.this use are reasonably accurate.

To account for the variance between the estimated and reported ground water production for the ensuing (1966-67) water year, it is recommended that the estimates of production as reported in Table 3 be adjusted so that the total required revenue is obtained. The recommended adjustments are shown in Table 4.

TABLE 4

ESTIMATED GROUND WATER PRODUCTION FOR ZONE W-2

Values in Acre-Feet

Use	Estimated		
	1964-65	1965-66	1966-67
Agricultural	100,000	97,000	94,000
Other Than Agricultural	119,000	121,000	123,000
	Reported	Recommended Estimates	
Agricultural	36,800	43,000	70,000
Other Than Agricultural	118,200	120,000	122,000

The engineering, right-of-way, and construction costs of the In-County Water Distribution System, including the water treatment plant costs, will be paid from the proceeds of the $42,050,000 bond issue passed by the electorate of Zone W-1 in June 1963. Bonds sold will be repaid with revenues from the ground water charges and the sale of treated water. The first sale of bonds in January 1964 totaled $15,500,000 and will be repaid at a rate of about $750,000 per year over a period of 39 years. The second sale of bonds scheduled for the spring of 1966 will total about $12,500,000. The actual sale will depend on construction proposals accepted in March.

Construction of the Central Pipeline, the first phase of the In-County Water Distribution System, was completed in 1965 and is under operation. Construction of the Almaden Valley Pipeline (Unit I), the second phase of the System, will be completed early in 1966 and under District operation in the current (1965-66) water year. Engineering design of the third phase, the Rinconada Water Treatment Plant, Rinconada Force Main and the West Pipeline (including the Santa Clara and Campbell Distributaries) is complete and the projects will be advertised for construction proposals in March, 1966. Expenditures for this work will exceed the proceeds from the first sale of bonds and funds from the second bond sale will be used to complete phase three work.

The installation of water meters on agricultural wells will be completed in the current (1965-66) water year.

The estimated expenditures during the ensuing (1966-67) water year are tabulated in Table 5.

TABLE 5

ESTIMATED EXPENDITURES DURING 1966-67

Purpose	Estimated Expenditure
State of California	
Capital Cost	$ 975,000
Operation & Maintenance	330,000
Bureau Water	130,000
Delta Water Charge	90,000
District Expenses	
(a) Engineering	145,000
(b) Operations	140,000
(c) Water Use	165,000
Bond Redemption	
Series A (1st bond sale)	753,000
Series B (2nd bond sale)	570,000
Total	$3,298,000

Recommended Ground Water Charges

The total estimated expenditures exclusive of those expenditures repaid by the treated water charge during 1966-67 will be paid from current revenues, the ad valorem tax and ground water charges. It is estimated that the five cents per 100 dollars assessed valuation ad valorem tax will raise a net amount of about $780,000(1). This leaves about $2,518,000 to be raised by the ground water charges. Applying the $5.00 per acre-foot rate to the recommended estimate of agricultural ground water production from Table 4 would raise about $350,000. The remainder of the costs would have to be assessed against the ground water production for uses other than agriculture, and therefore, this ground water charge will have to be $17.80 per acre-foot.

Projections of estimated expenditures indicate that if the ground water charge for water extracted for other than agricultural uses is held at $16.00 per acre-foot, it will be possible to meet anticipated costs for the ensuing (1966-67) water year provided carryover funds are used. The use of this rate will substantially reduce the reserve by the end of the ensuing (1966-67) water year. Nevertheless, it is recommended that the ground water charge for water extracted for uses other than agricultural uses remain at $16.00 per acre-foot for 1966-67.

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(1) The ad valorem tax is estimated to raise a total of $914,000 but under the pricing policy adopted before the bond issue, a portion of this revenue will be returned to those cities obtaining all or a part of their water supply from the Hetch-Hetchy Aqueduct. This rebate is estimated to amount to $134,000 leaving a net revenue of $780,000.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

Pursuant to Section 26.5 of the Santa Clara County Flood Control and Water District Act, an investigation of the ground water conditions of the District and Zones thereof has been completed. This chapter presents a summary of the findings derived from the results of this investigation and recommendations based upon these findings.

Summary of Findings

1. The major ground water basins of the Santa Clara County Flood Control and Water District are the Santa Clara Valley Ground Water Basin in the northern portion of the County, the Coyote Ground Water Basin in the center of the District, and the Llagas Ground Water Basin in the southern portion of the District.

2. A ground water charge zone, Zone W-2, was established on February 11, 1963. Zone W-2 includes most of the Santa Clara Valley Ground Water Basin within its boundaries.

3. The seasonal water supply Surplus (+) or Deficiency (-) to the zones or ground water basins of the District for the preceding (1964-65), current (1965-66), and ensuing (1966-67) water years is estimated to be

(in acre-feet):

	Preceding	Current	Ensuing
Zone W-2	-53,500	-9,100	+8,500
Coyote G. W. B.	-2,300	-700	-700
Llagas G. W. B.	+5,700	-8,500	-12,200

4. The accumulated overdraft represented by the change in ground water storage between the ground water table elevation in 1942 (assumed desirable) and 1965 is estimated to be:

Zone W-2	685,000 acre-feet
Coyote Ground Water Basin	0 acre-feet
Llagas Ground Water Basin	0 acre-feet

5. The primary source of water put to beneficial use in the zones or ground water basins of the District is ground water and the total extractions in acre-feet during the preceding (1964-65), current (1965-66) and ensuing (1966-67) water years is estimated to be:

	Preceding	Current	Ensuing
Zone W-2	219,000	218,000	217,000
Coyote G. W. B.	12,000	12,000	12,000
Llagas G. W. B.	61,000	65,000	69,000

6. The estimated amount of ground water to be extracted for agricultural use from the zones or ground water basins of the District during the ensuing (1966-67) water year is:

Zone W-2	94,000 acre-feet
Coyote Ground Water Basin	10,000 acre-feet
Llagas Ground Water Basin	57,000 acre-feet

7. The estimated amount of ground water to be extracted for uses other than agricultural use from the zones or ground water basins of the District during the ensuing (1966-67) water year is:

Zone W-2	123,000 acre-feet
Coyote Ground Water Basin	2,000 acre-feet
Llagas Ground Water Basin	12,000 acre-feet

8. A program for the importation of supplemental water to help alleviate the current and accumulated ground water overdrafts in the Santa Clara Valley Ground Water Basin has been formulated and a contract signed with the State to supply a maximum annual amount of 100,000 acre-feet. Initial deliveries were made in June 1965 from the South Bay Aqueduct. In the ensuing (1966-67) water year the District is obligated to import 48,500 acre-feet through the South Bay Aqueduct.

9. An In-County Water Distribution System to deliver imported water to the points of ground water recharge and surface delivery treatment plants in Zone W-2 is being constructed. Construction of the Central Pipeline was completed in 1965 and construction of the Almaden Valley Pipeline - Unit 1 will be complete in the current (1965-66) water year. Contracts have been signed for the initial delivery of treated water in early 1967, and design was completed in March 1966 for the Rinconada Water Treatment Plant, the Rinconada Force Main and West Pipeline (including the Santa Clara and Campbell Distributaries). These projects will be advertised for bids in March 1966.

10. Expenditures for the District's share of the cost of construction, maintenance and operation of the South Bay Aqueduct, including the Bureau Water Charge, in the ensuing (1966-67) water year are estimated to amount to $1,525,000. Bond redemption charges during the ensuing (1966-67) water year are estimated to amount to $1,323,000 and District expenses, including operation costs of the In-County Distribution System, will amount to $450,000.

11. A county-wide ad valorem tax of 5 cents per 100 dollars assessed valuation will not provide sufficient revenues in the ensuing (1966-67) water year to meet the anticipated expenditures for the capital cost portion of

the costs to the District of the South Bay Aqueduct.

12. A ground water charge based on adjusted estimates of production from the ground water supplies in Zone W-2 of five dollars per acre-foot for agricultural extractions and $17.80 per acre-foot for non-agricultural extractions is necessary to meet anticipated expenditures in the ensuing (1966-67) water year. If the reserve can be utilized, the ground water charge rate for water extracted for other than agricultural use could be reduced to $16.00.

Recommendations

Based on these findings it is recommended:

1. That the District complete the construction of the present phases of the In-County Water Distribution System including the treated water facilities in order to distribute the quantities of imported water that the District is obligated to purchase in the ensuing years.

2. That a county-wide ad valorem tax of 5 cents per 100 dollars assessed valuation be continued for the ensuing (1966-67) water year and collected to pay a portion of the anticipated charges for the District's share of the construction of the South Bay Aqueduct.

3. That a ground water charge of five dollars per acre-foot for agricultural extractions and $16.00 per acre-foot for non-agricultural extractions be levied and collected in Zone W-2 for the ensuing (1966-67) water year to pay the remaining charges to the State, the distribution system operation charges, and the bond redemption charges for the In-County Water Distribution System.

4. That the District Board of Supervisors make the following determinations for Zone W-2 in accordance with Section 26.6 of the District Act:

   a. The annual water supply deficiency for the preceding (1964-65) water year was about 53,500 acre-feet.

b. The estimated annual water supply deficiency for the current (1965-66) water year is about 9,100 acre-feet.

c. The estimated annual water supply surplus for the ensuing (1966-67) water year will be about 8,500 acre-feet.

d. The accumulated overdraft as of the last day of the preceding (1964-65) water year was about 685,000 acre-feet.

e. The amount of ground water (as reported in production statements) extracted in the preceding (1964-65) water year was 118,200 acre-feet for non-agricultural uses and 36,800 acre-feet for agricultural uses.

f. The adjusted estimated amount of agricultural water to be withdrawn from the ground water supplies of Zone W-2 for the current (1965-66) water year is about 43,000 acre-feet.

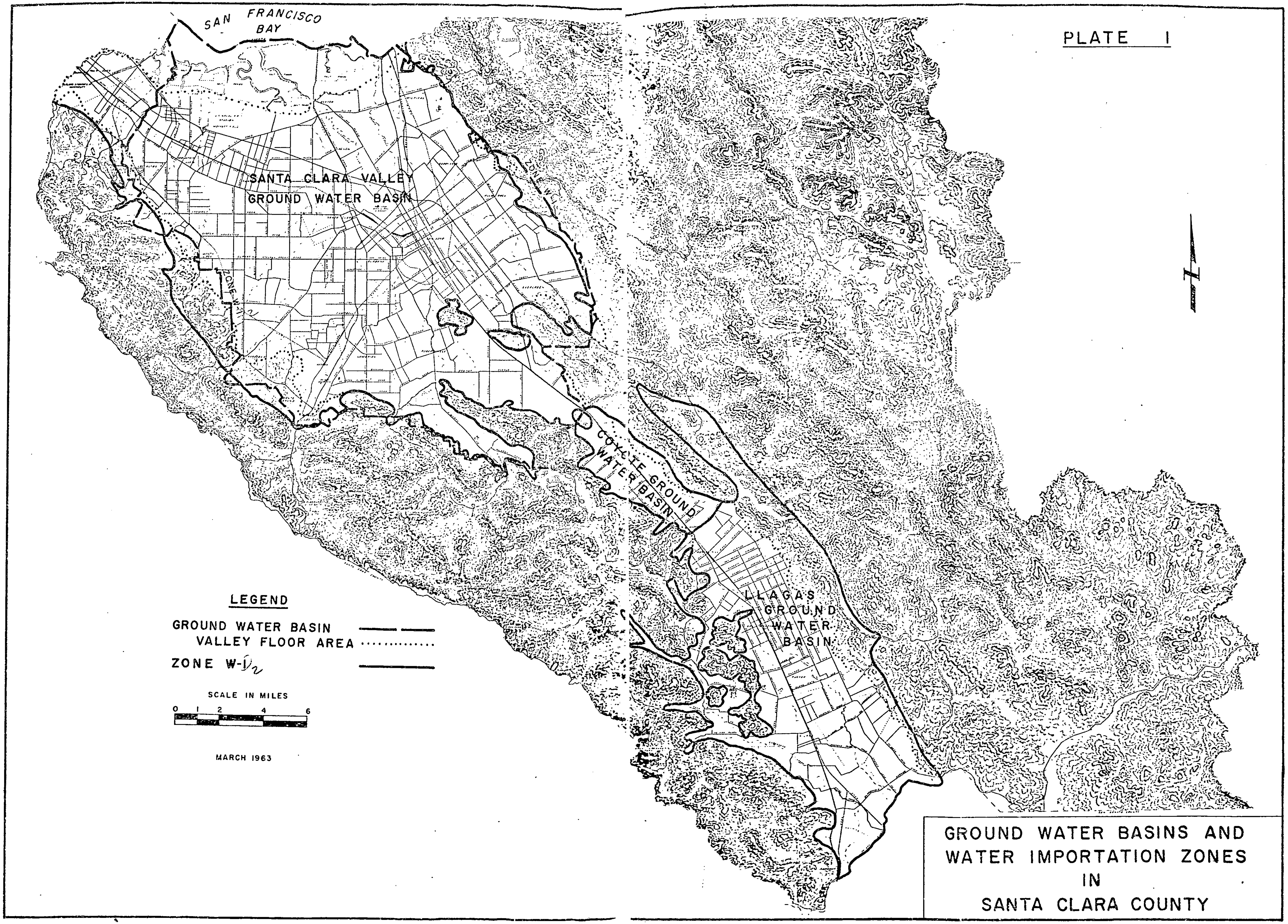
g. The adjusted estimated amount of water other than agricultural water to be withdrawn from the ground water supplies of Zone W-2 for the current (1965-66) water year is about 120,000 acre-feet.

h. The adjusted estimated amount of agricultural water to be withdrawn from the ground water supplies of Zone W-2 for the ensuing (1966-67) water year is about 70,000 acre-feet.

i. The adjusted estimated amount of water other than agricultural water to be drawn from the ground water supplies of Zone W-2 for the ensuing (1966-67) water year is about 122,000 acre-feet.

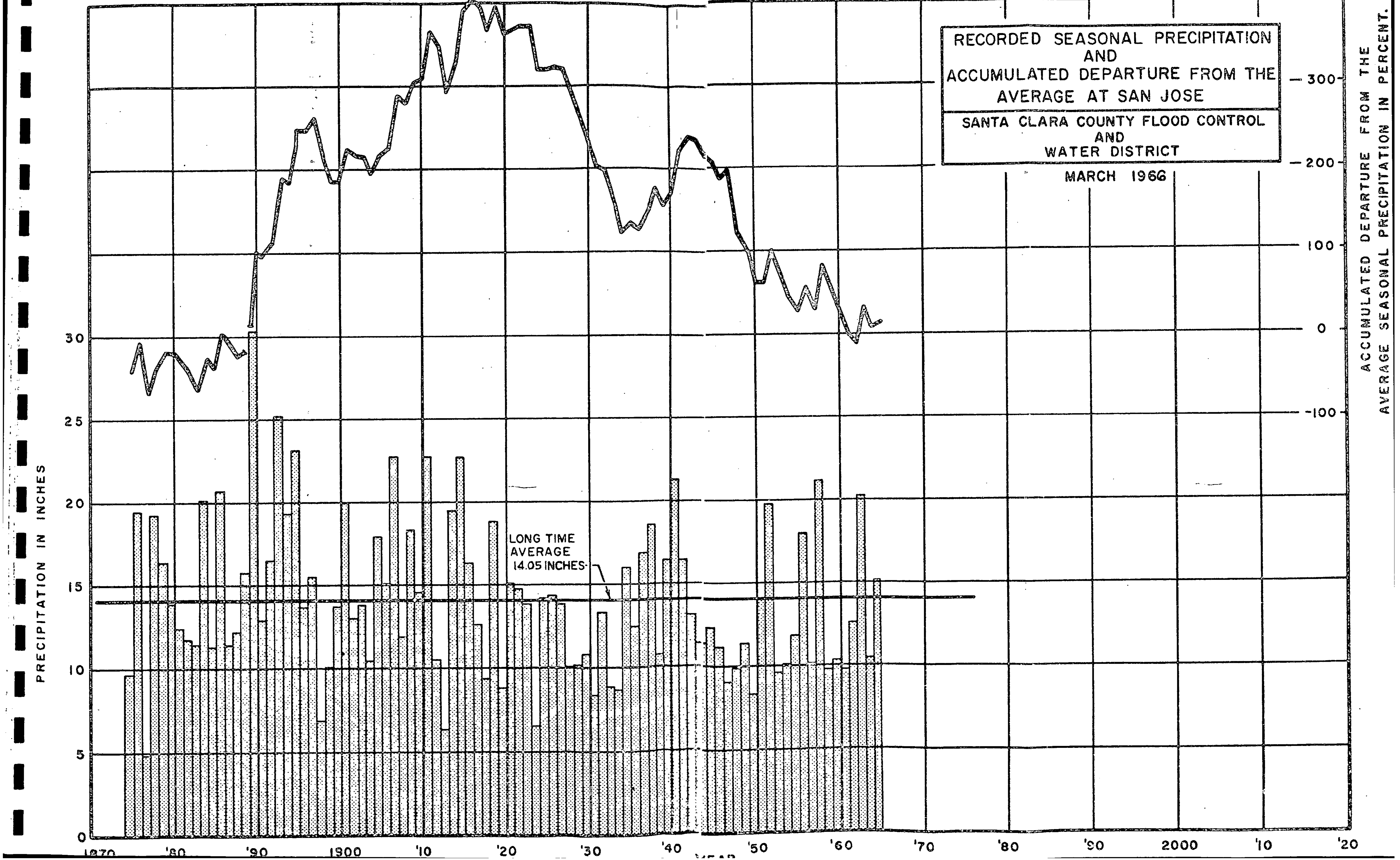
j. The District is obligated by contract to purchase about 48,500 acre-feet of water in the ensuing (1966-67) water year.

PLATE 1



GROUND WATER BASINS AND WATER IMPORTATION ZONES IN SANTA CLARA COUNTY

PLATE II

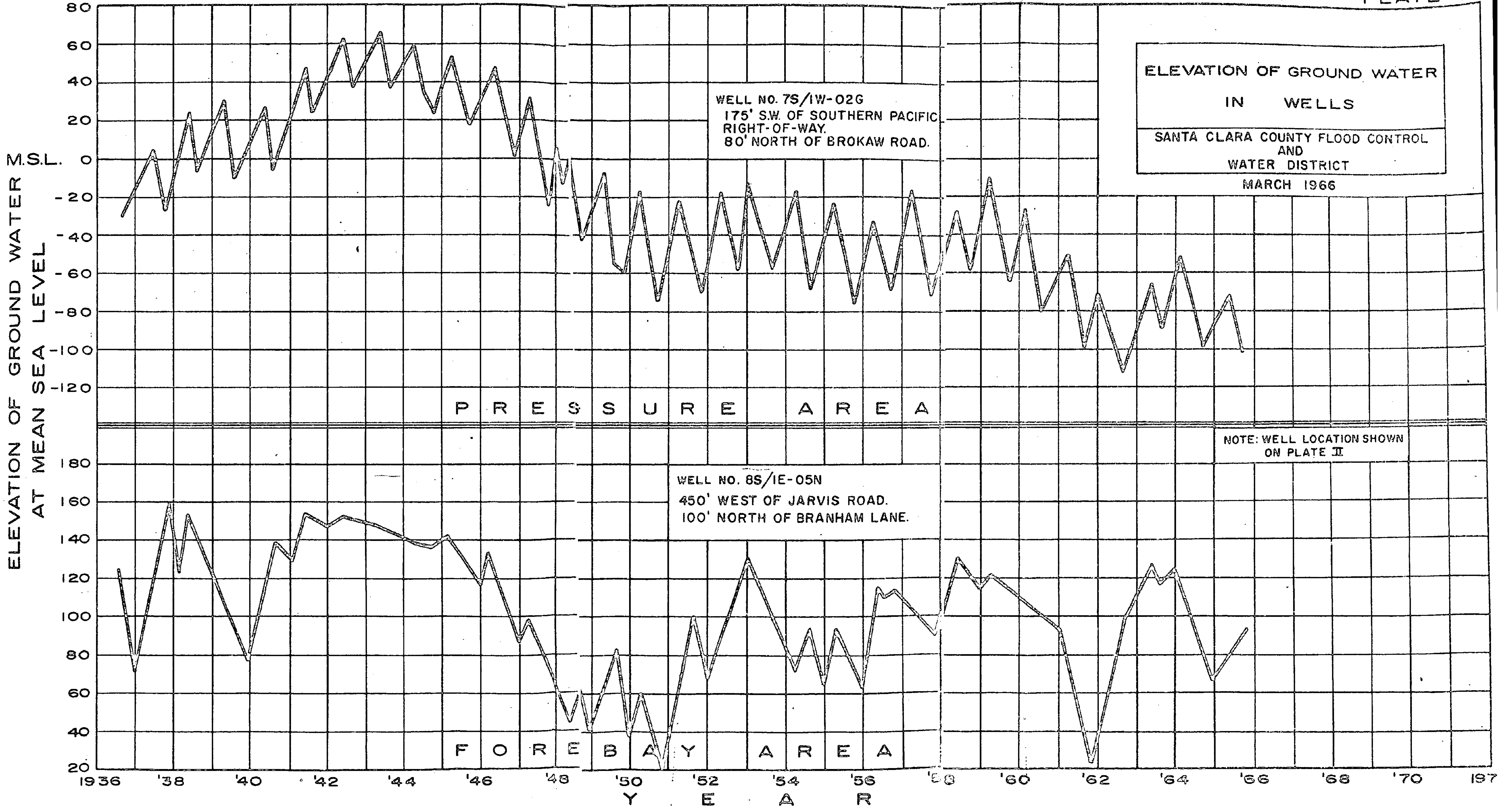


RECORDED SEASONAL PRECIPITATION
AND
ACCUMULATED DEPARTURE FROM THE
AVERAGE AT SAN JOSE

SANTA CLARA COUNTY FLOOD CONTROL
AND
WATER DISTRICT

MARCH 1966

PLATE III

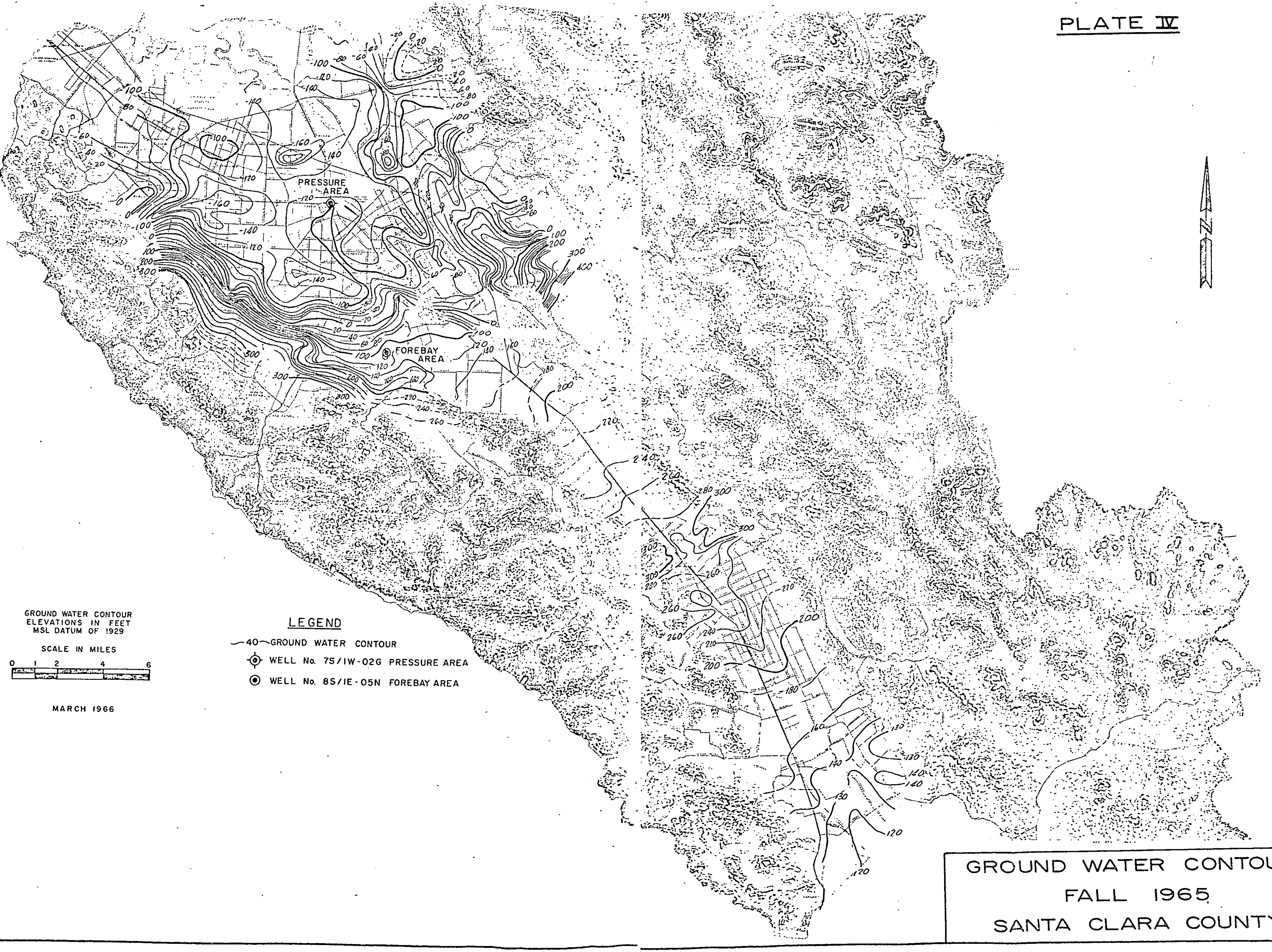


ELEVATION OF GROUND WATER
IN WELLS

SANTA CLARA COUNTY FLOOD CONTROL
AND
WATER DISTRICT

MARCH 1966

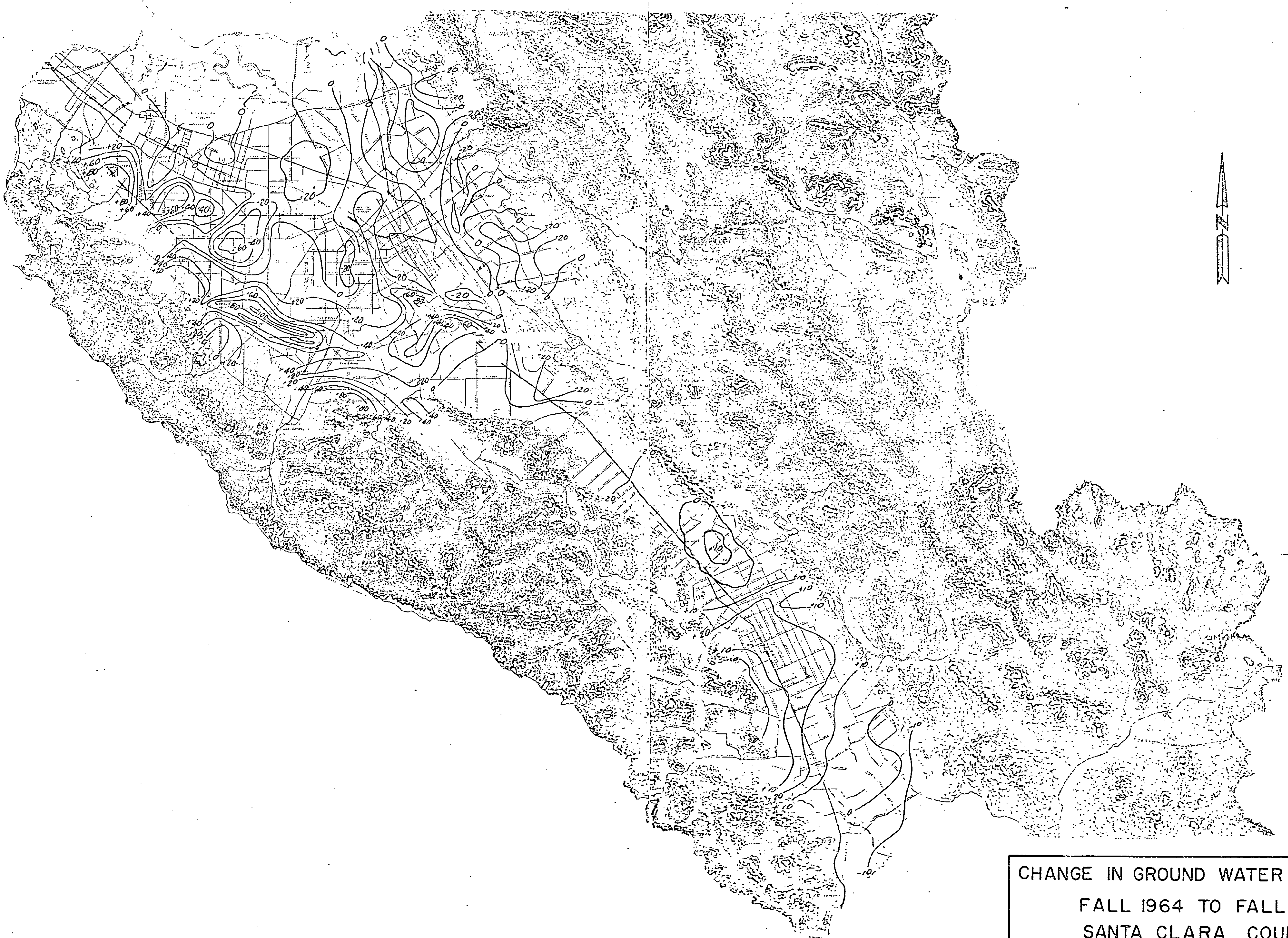
PLATE IV


N
PRESSURE AREA
FOREBAY AREA
LEGEND
40 GROUND WATER CONTOUR
WELL No. 7S/1W-02G PRESSURE AREA
WELL No. 8S/1E-05N FOREBAY AREA
GROUND WATER CONTOUR ELEVATIONS IN FEET MSL DATUM OF 1929
SCALE IN MILES
0 1 2 4 6

MARCH 1966

GROUND WATER CONTOURS
FALL 1965
SANTA CLARA COUNTY

PLATE V



CHANGE IN GROUND WATER ELEVATIONS

FALL 1964 TO FALL 1965

SANTA CLARA COUNTY